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समुद्री मात्स्यिकी सूचना सेवा : समुद्री मात्स्यिकी पर आधारित अनुसंधान परिणामों को आयोजकों, मत्स्य उद्योगों और मत्स्य पालकों के बीच प्रसार करना और तकनोलजी का प्रयोगशाला से श्रमशाला तक हस्तांतरित करना इस तकनीकी और विस्तार अंकावली का लक्ष्य है ।

THE MARINE FISHERIES INFORMATION SERVICE : Technical and Extension Series envisages dissemination of information on marine fishery resources based on research results to the planners, industry and fish farmers and transfer of technology from laboratory to field.

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SOCIO-ECONOMIC STATUS OF MARINE FISHERMEN ALONG MADRAS COAST*

Introduction

All fishery developmental programmes are formulated with the objective of creating a base for increasing production and raising the economic status of people involved in this sector. However, the successful implementation of such programmes depends on the socio-economic condition of the target group. For planning and management of fisheries, greater attention has to be given to the social and economic aspects. Lack of such information has been one of the most serious impediments to effective policy making and planning, especially in the case of small-scale fisheries. In this context the Central Marine Fisheries Research Institute has taken up a project to conduct socio-economic surveys of small-scale fisheries in selected areas. The present paper gives the results of such a study conducted in two fishing villages, Thiruvottiyoorkuppam where non-mechanised fishing is carried out and Pudumanikuppam where fishing is done using mechanised crafts along the Madras coast during 1984-'85.

The definitions of terminologies used in the collection and interpretation of data are given below:

1. *Fisherman household:* Any household wherein atleast one member of the family is engaged either in active fishing or fishery related activities.
2. *Type of houses:*
   a) *Hut:* A dwelling with thatched roof and having either a mud wall or an enclosure made of *thattis*.
   b) *Kutcha house:* A dwelling with a thatched roof and brick wall.
   c) *Pucca house:* A dwelling with tiled roof and brick wall.
   d) *Concrete house:* A dwelling having concrete roof.
3. *Literates:* All persons who can read and write.
4. *Educational status:*
   a) *Primary:* Those who passed 5th standard.
   b) *Secondary:* Those who passed 10th standard.
   c) *Higher secondary:* Those who passed 12th standard.
5. *Family (household):* Members sharing meals from one kitchen.
6. *Children:* All males and females below 12 years of age.
7. *Major occupation:* Occupation which brings more than 50% of the household income.
8. *Active fishermen:* Fishermen who actively engage in fishing as main occupation.
9. *Wage earners:* Fishermen who engage in fishing in other's boats for wages.
10. *Fishery related activities:* Activities like fish trading, processing/curing, transporting, loading/unloading, net splicing/repairing, boat building/repairing and other activities related to fishery.
11. *Other activities:* All non-fishery occupations.

* Prepared by R. Sathiadhas and K.K.P. Panikkar, Central Marine Fisheries Research Institute, Cochin.

Results and discussion

All the 137 fishermen households in Pattinaverkuppam segment of Thiruvottiyoorkuppam and 601 households in Pudumanikuppam were covered in the socio-economic survey. About 95% of the households belong to Pattinaver community, others being Harijans, Telugu Naidus and Christian Meenava communities. A look on the housing pattern reveals that 90% of the fishermen households of Thiruvottiyoorkuppam and 66% of Pudumanikuppam are dwelling in huts (Table 1). The fishermen population of Pudumanikuppam comes to 3,223 and of Pattinavarkuppam to 747. The average size of fishermen families along with population composition, literacy and educational status in both the villages are given in Table 2. There is no striking difference in the average size of fishermen households in both the villages as it is 5.4 in Pudumanikuppam and 5.5 at Thiruvottiyoorkuppam. About 67% of the fishermen at Pudumanikuppam and 40% in Thiruvottiyoorkuppam are illiterates. Among the literates at Pudumanikuppam 38% each have primary and secondayr education and 24% higher secondary education, and at Thiruvottiyoorkuppam 48% have primary education, 45% secondary and 7% higher secondary education.

The ratio between earning members and dependents is approximately 1:3 in Pudumanikuppam and 1:2 in Thiruvottiyoorkuppam. Out of a total population of 3,970 in the two villages, 1,430 persons (36%) are employed (Table 3). It is observed that out of those employed 59% in Pudumanikuppam and 56% in Thiruvottiyoorkuppam have active fishing as their occupation. Among those employed in fishery related activities, fish traders form the maximum (25% in Pudumanikuppam and 17% in Thiruvottiyoorkuppam) in both the villages.

Table 1. *Village-wise distribution of different types of houses*

Type of house	Pudumani-kuppam	Thiruvottiyoor-kuppam
Huts	398	124
Kutcha	114	3
Pucca	56	—
Concrete	33	10
Total	601	137

Table 2. *The distribution of population, households, size of family and literacy*

Item	Pudumani-kuppam	Thiruvottiyoor-kuppam
1. No. of house holds	601	137
2. *Population details*		
Adults		
Male	1,016	256
Female	1,059	249
Children		
Male	650	117
Female	498	125
Total	3,223	747
3. Average size of family	5.4	5.5
4. Literacy rate	33%	60%
5. Educational status		
Primary	403 (38%)	215 (48%)
Secondary	405 (38%)	202 (45%)
Higher secondary & above	251 (24%)	34 (7%)

Table 3. *Distribution of fishermen based on occupation*

Occupation	Pudumani-kuppam		Thiruvo-ttiyoor-kuppam	
	No. of fisher-men	Per cent	No. of fisher-men	Per cent
1. Active fishing	652	59	177	56
2. Fish trade	282	25	55	17
3. Net splicing/ repairing	14	1	16	5
4. Drying/curing of fish	14	1	30	9
5. Other fishery related activities	88	8	2	2
6. Other activities	62	6	38	12
Total	1,112	100	318	100

Table 4. *Family-wise distribution of means of production and capital investment (in brackets percentages)*

Ownership of craft/gears	No. of families		Investment on fishing equipments (Rs.)	No. of families	
	Pudumani-kuppam	Thiruvotti-yoorkuppam		Pudumani-kuppam	Thiruvotti-yoorkuppam
Gear alone	4 (4)	—		21 (23)	13 (17)
			<2,500		
Catamaran alone	16 (17)	—	2,501– 5,000	27 (29)	23 (31)
Catamaran with one type of gear	41 (45)	44 (59)	5,001– 7,500	15 (17)	18 (24)
Catamaran with two types of gears	20 (22)	14 (19)	7,501–10,000	13 (14)	14 (19)
Catamaran with 3 or more types of gears	4 (4)	13 (17)	>10,000	16 (17)	7 (9)
Non-mech. plank-built boats	—	4 (5)			
Mechanised boats	7 (8)	—			

Table 5. *Classification of fishermen families based on major occupation and annual income*

Income group (Rs.)	Pudumanikuppam		Thiruvottiyoorkuppam	
	Fishery activities	Non-fishery activities	Fishery activities	Non-fishery activities
< 2,000	18	—	11	—
2,000–4,000	124	30	58	10
4,000–6,000	84	27	29	8
6,000–8,000	111	10	2	8
8,000–10,000	51	9	—	3
10,000–12,000	24	7	—	2
12,000–14,000	41	10	—	6
> 14,000	27	28	—	—
Total	480	121	100	37

About 6% in Pudumanikuppam and 12% in Thiruvottiyoorkuppam are employed in other sectors like services, business *etc.*

The fishermen families of Thiruvottiyoorkuppam wholly depend on indigenous fishing whereas those of Pudumanikuppam engage in traditional as well as mechanised fishing. About 55% of the households at Thiruvottiyoorkuppam and 16% at Pudumanikuppam have ownership of crafts and gears. Among the fishermen families having ownership of means of production, 21% at Pudumanikuppam have ownership of either gears alone or only catamarans (Table 4). About 67% of the owners in Pudumanikuppam and 78% in Thiruvottiyoorkuppam possess one or two types of nets which are not sufficient for efficient operation through out the year. Only 4% of the catamaran owners in Pudumanikuppam and 17% at Thiruvottiyoorkuppam possess three or more type of gears. At Pudumanikuppam 8% of them have ownership of mechanised boats and at Thiruvottiyoorkuppam 5% have non-mechanised plank-built boats.

The initial investment on catamaran logs ranges from Rs. 1,000 to 5,000 per unit and non-mechanised plank-built boat ranges from Rs. 5,000 to 7,000, most of them being second hands. With regard to capital investment on fishing equipments, 23% of the owners at Pudumanikuppam and 17% at Thiruvottiyoorkuppam have invested less than Rs. 2,500 (Table 4). The capital investment on fishing equipments has been in the range of Rs. 2,501 to 5,000 for 29% and 31%, Rs. 5,001–7,500 for 17% and 24%, Rs. 7,501–10,000 for 14% and 19% and above Rs. 10,000 for 17% and 9% at Pudumanikuppam and Thiruvottiyoorkuppam respectively. The non-mechanised plank-built boats are operating gillnets (locally called as *Periya valai* costing about Rs. 5,000) throughout the year. The gears commonly used by catamarans are *Thattukavali valai, Gonda valai, Kavalai valai, Mathi valai, Thoori valai* and *Ral vala* for different seasons. The average initial investment on these gears ranges from Rs. 750 for *Mathi valai* to Rs. 2,500 for *Thattukavali valai.* The actual fishing days for catamaran units ranged from 177 to 276 during 1984–'85.

Table 6. *Annual expenditure pattern in Rupees of different categories (*1984–'85)

Item	Pudumanikuppam			Thiruvottiyoorkuppam		
	Catamaran owners	Wage earners	Allied group	Catamaran owners	Wage earners	Allied group
Food	4,475.00	3,160.00	3,280.00	4,144.60	2,635.00	2,900.00
Cloth and foot wear	527.00	620.00	432.00	981.60	566.00	444.00
Light and fuel	197.00	172.00	156.00	182.40	120.00	126.00
Education	92.00	51.00	60.00	125.00	73.60	102.00
Tobacco and bidis	586.00	310.00	516.00	113.00	153.60	82.00
Medical	75.00	130.00	48.00	17.00	120.00	62.00
Conveyance and entertainment	1,524.00	837.00	1,032.00	552.00	281.00	466.00
Others	411.00	260.00	352.00	226.00	132.80	142.00
Annual total	7,617.00	5,540.00	5,886.00	6,341.60	4,082.00	4,324.00
Per day expenditure	20.87	15.18	16.10	17.37	11.18	11.85

Table 7. *Occupation-wise fishermen families and the extent of credit with source*

Village / Type of occupation	Families availed loan (%)	Loan per indebted family (Rs.)	Percent contribution of loan				Others
			Fish traders	Money lenders & boat owners	Co-op. society	Banks	
Thiruvottiyoorkuppam							
Craft owners	24	600	7	—	—	—	93
Wage earners	76	769	13	84	—	3	—
Fishery allied group	40	200	38	62	—	—	—
Pudumanikuppam							
Craft owners	30	1,000	—	—	42	16	42
Wage earners	55	850	15	68	—	—	17
Fishery allied group	40	250	40	—	20	—	40

Analysis of income levels of the fishermen families has brought out some interesting results. The income-wise distribution of fishermen families in both the villages is given in Table 5. It is seen that the families in the income group of Rs. 2,000–4,000 per year are more in both the places. This group is mostly constituted by the wage earners. They are under-employed as the catamaran owners do not engage them during the lean seasons. Similarly it is seen that the families in which atleast one member is engaged in non-fishery activities are economically well off and there is no family in this category with an annual income of less than Rs. 2,000 in both the places. Further it is seen that among the fishermen households at Thiruvottiyoorkuppam who are engaged in fishing and allied activities, no family earns an income of above Rs. 8,000 per annum. This is mainly due to the fact that not a single fisherman household at Thiruvottiyoorkuppam owns a mechanised boat. The average annual income of a fisherman household in Pudumanikuppam worked out at Rs. 7,600 as against Rs. 4,500 at Thiruvottiyoorkuppam. The average annual income of a fisherman household, depending entirely on fishing and fishery related activities, is found to be Rs. 7,100 in Pudumanikuppam and Rs. 3,500 in Thiruvottiyoorkuppam while fishermen families in which atleast one member is engaged in other activities is found to be Rs. 9,500 in the former and Rs. 7,000 in latter village.

The household expenditure pattern of fishermen families representing catamaran owners, wage earners and those engaged in allied activities in Thiruvottiyoorkuppam and Pudumanikuppam is given in Table 6. About 56 to 57% of the household expenditure in Pudumanikuppam and 64 to 67% in Thiruvottiyoorkuppam is for food items. The annual household expenditure was Rs. 7,617 and Rs. 6,342 for families of catamaran owners, Rs. 5,540 and Rs. 4,082 for wage earners and Rs. 5,886 and Rs. 4,324 for families engaged in allied activities in Pudumanikuppam and Thiruvottiyoorkuppam respectively. The expenses for conveyance and entertainment range from 15 to 18% of household expenditure at Pudumanikuppam and 7 to 11% at Thiruvottiyoorkuppam. It may be noted that the expenditure incurred for the purpose of education and medical care is the least in the household expenditures.

The average household expenditure per day worked out at Rs. 21 for catamaran owners, Rs. 15 for wage earners and Rs. 16 for families engaged in fishery related activities at Pudumanikuppam. The average daily household expenditure at Thiruvottiyoorkuppam was found to be Rs. 17 for catamaran owners, Rs. 11 for wage earners and Rs. 12 for those engaged in allied activities.

Credit facilities

The availability of credit is a major indication of the tempo of economic activities of any area. The extent of credit availability is comparatively very low to the traditional fishermen. The percentage of families in debt in this area ranges from 24 for craft owners to 76 for wage earners. The information on the extent of indebtedness and contribution of different agencies in the supply of credit is given in Table 7.

Among catamaran owners 24% at Thiruvottiyoorkuppam and 30% at Pudumanikuppam are in debt, the average outstanding debt per indebted family being

Rs. 600 at the former place and Rs. 1,000 at the latter. The magnitude of credit provided by institutional agencies is nil at Thiruvottiyoorkuppam and about 58% at Pudumanikuppam. About 75% of the wage earners at Thiruvottiyoorkuppam and 55% at Pudumanikuppam have availed loans, the average outstanding loan per indebted family being Rs. 769 and Rs. 850 respectively. Almost the entire loan amount advanced to wage earners is contributed by the non-institutional agencies. About 40% of fishermen in both the places engaged in fishery allied activities are in debt. The average outstanding debt per indebted family of this group has been Rs. 200 at Thiruvottiyoorkuppam and Rs. 250 at Pudumanikuppam.

The role of institutional agencies in providing loan to the traditional fishermen of Thiruvottiyoorkuppam and Pudumanikuppam was very meagre. The co-operative societies and the commercial banks can play a better role under specialized schemes in providing loans to the fishermen for the purchase of crafts and gears. The linkage of production with marketing through co-operatives will be immensely helpful to avoid the default of repayment and to eliminate middlemen from fish trading.

Landing and disposal of catch

Both Thiruvottiyoorkuppam and Pudumanikuppam landing centres are primary fish markets. At Thiruvottiyoorkuppam the number of fish traders is comparatively very less and in general fishermen get lesser price. Hence during the time of higher catches, the catamarans operating from here used to land catches at Pudumanikuppam. The role of women in the subsidiary activities of marine fishing is considerable in Madras region. About 70% of the persons participating in marketing activities at these landing centres comprised women. Among the 30 auctioneers at Pudumanikuppam, 25 are women. Similarly among 35 petty traders at the landing centre, 30 are women. There are about 50 women involved in sorting of fish and peeling of prawns. Daily, on an average, 10 cycle rickshaws are engaged in the transportation of fish waste from Pudumanikuppam for drying.

The mode of disposal of fish at the landing centre is auctioning. Wholesalers, retailers and bulk consumers participate in the auctioning. There is a set of auctioneers at the landing centre. Among them there are two groups; one being those who simply charge 2 to 5% of the gross value of the disposed product as their commission. The other group of auctioneers advance loan to the craft owners under a contract by which auctioning can be done only by them. This group of auctioneers not only take 2 to 5% of the gross value of the fish as their commission for auctioning but also 8 to 15% of the catch as the interest for the money advanced. There are both male and female auctioneers and it is their duty to collect the money and deliver it to the fishermen. Two types of auctioning prevail in this area. In one case, after the catch is sorted out into different groups, a bulk of each group is auctioned starting from a low value and in the other, mostly for prawns, the price per kg will be fixed by auction and the same will be disposed off after weighing, to the highest bidder.

Fish being a perishable commodity, the auctioning of it provides maximum competition among the buyers and enables quick disposal. But at times it also leads to problems especially during bumper catches. The buyers more frequently, especially at small landing centres, join together and quote very low prices depriving the fishermen from getting the benefit of the spurt in the market Here the public agencies can play a better role by entering the market to purchase the excess supply over demand at a minimum support price.

Usually 2 to 4 fishermen go in a catamaran for fishing. The number of persons going for fishing depends on the size of the craft and the type and number of gears used for fishing operations. Normally the sharing system is followed in the distribution of revenue. The revenue is divided equally among the crew members keeping aside a single share for the craft and gear. The share of the craft and gear differs depending on the type of gear used. Whenever the gears operated are comparatively costly and the risk involved is also more, the net proceeds are divided into three shares, one for the craft and gear and the rest being equally divided among the crew. However, a fixed ratio for sharing is not strictly followed on all the days of fishing. Whenever there is very less returns, the operational cost is entirely borne by the craft owner and the gross returns is equally divided among the crew.

Conclusions and recommendations

The average annual income of a fisherman household works out at Rs. 7,600 at Pudumanikuppam and Rs. 4,500 at Thiruvottiyoorkuppam and the percapita income at Rs. 1,417 in the former and Rs. 837 in the latter. Since Pudumanikuppam is a major landing centre, fishermen are not only engaged in active fishing but also involved in diversified fishery related activities. Among the active fishermen many are involved in mechanised fishing as wage earners. Further both mechanised and traditional fishermen at Pudumanikuppam realise better income due to comparatively higher prices

for their catch. Diversified fishery activities resulted from mechanisation and better infrastructure facilities are the factors responsible for better income at Pudumanikuppam as compared to Thiruvottiyoorkuppam.

The study indicates that 84% of the fishermen households at Pudumanikuppam and 46% at Thiruvottiyoorkuppam have no means of production. Even among the fishermen who have ownership of fishing equipments, about 90% at Pudumanikuppam and 80% at Thiruvotiyoorkuppam possess catamaran. Most of these catamaran owners have only one or two types of nets which is not sufficient for efficient operation throughout the year.

The daily average household expenditure worked out at Rs. 21 for catamaran owners, Rs. 15 for wage earner and 16 for families engaged in fishery related activities at Pudumanikuppam. It was found to be Rs. 17 for catamaran owner, Rs. 11 for wage earners and Rs. 12 for those engaged in fishery related activities at Thiruvottiyoorkuppam. The expenses incurred on health and education purposes are found to be very low in both the villages. Credit availability in these two villages is also not sufficient and 47% of the households at Pudumanikuppam and 42% at Thiruvottiyoorkuppam are in debt. The average outstanding debt per indebted household ranges from Rs. 200 to Rs. 1,000 for different categories. The role of co-operative societies and commercial banks in supplying credit is found to be negligible.

Based on the study, a few suggestions are made for the overall development of traditional fishery in this area. It has been observed that price of catamaran logs has been fast escalating in recent years and the catamaran fishermen who are only at subsistance level of operation find it difficult to replace the old logs with new ones. Hence it is suggested that logs can be supplied to catamaran operators at subsidised rates by the Forest Department of State Government. At present, for long and short term loans, not only for the investment in fishing equipments but also for household expenditure to tide over the lean season, the fishermen have to depend on private money lenders by which they remain perpetually in debt. Formation of village level co-operatives of fishermen is essential not only to provide credit to acquire means of production but also to do fish marketing and to supply fishing equipments at reasonable price.

Pudumanikuppam is the biggest fish landing centre along Madras coast. The fisheries harbour available here has not been utilized for landing of fishing boats. Hence steps have to be initiated for the effective utilization of harbour by fishermen. But this centre does not have proper infrastructure facilities such as ice plants, freezing plants *etc.* Fishermen can get reasonable price for their produce only if adequate infrastructure facilities are made available at the landing centre.

Sea erosion is a major problem in Thiruvottiyoorkuppam, which has to be prevented on an urgent basis. The conflicts between mechanised and non-mechanised sectors can be avoided by restricting the area of operation of mechanised boats. Since the employment pressure on traditional fishery sector is on the increase, most of the fishermen are under-employed. Hence it is imperative to create alternate employment opportunities in the coastal areas to absorb the excess manpower in the fishery sector.

ON THE EMERGENCE OF OIL SARDINE FISHERY ALONG MADRAS COAST*

Oil sardine *Sardinella longiceps*, though forms one of the major pelagic fishery resources in India, has never formed a sizeable fishery along the Madras coast earlier and the present report deals with the emerging fishery along this coast since May to September, 1987.

* Prepared by J.C. Gnanamuttu and V. Thangaraj Subramaniam, Madras Research Centre of CMFRI, Madras.

Fishing operations and fishery

Boat seine locally called *Eda valai* - a traditional gear used by fishermen to catch pelagic shoals along this coast accounted for the bulk of the catches of oil sardine during May to September, '87. 'Eda valai' is a kind of bag net which is shallow with an extremely wide mouth nearly square measuring 18 m along each side. Two

large and two small catamarans are used for operating the net. One of the smaller catamarans is sent as a pilot which looks for fish shoal. If found, the larger catamarans are towed to the fishing area by mechanised boats which are also used as carrier boats to bring the catch quickly to the shore for auctioning. The catches were made at 6 to 10 m depth range off Tiruvanmiyur about 15 km south of Kasimedu fish landing centre at Madras.

Unusually heavy landings of oil sardine were noted during the second fortnight of May and the first fortnight of June along with mackerel, lesser sardine, mullets and shads (Fig. 1). The estimated number of units *(Eda valai)* operated, catch of oil sardine and catch per unit and percentage composition based on the observations made by the senior author are given below.

Lorries loaded with ice from Kerala sent by wholesale fish merchants especially from Calicut were used for transporting the fish for marketing in Kerala when the catch was heavy in May and June (Fig. 1). A basket of 50 kg was sold at the landing place for Rs. 100 to 150 depending upon the catch. At the other end a basket was sold for Rs. 200 or 250.

Biological observations

Fishes of 90 to 200 mm total length were represented in the landings. However, in the regular fishery, fish of 120–145 mm length range were brought by the boat seines. The bulk of oil sardine catches (90%) was formed by fish between 120 and 135 mm. The dominant size groups encountered in different months were 120–124 mm in May and August, 130–134 mm in June and July, 110–114 mm in September and 155-159 mm in January and March. Fish examined during May-September period were all immature and measured below 150 mm. In January and March, adult fish measuring above 150 mm were all mature in stages IV and V. Among mature fish, males predominated in the catches. The present observation on the mature oil sardine coincides with the observations already made during 1978 (Gnanamuttu, *Indian J. Fish.*, 31 (3), 1984). Stomach contents examined during May–September, '87, and January and March, '88 revealed the presence of copepods in small numbers and digested greenish matter in smaller quantities. More than 90% of the stomachs examined were empty.

Month	Units	Est. catch (kg)	CPUE (kg)	% of oil sardine in *Eda valai* catch
May	130	69,600	535.3	50
June	395	76,100	200.0	40.2
July	347	22,723	65.5	31.4
August	144	1,545	10.7	11.0
September	150	2,064	13.8	4.2

Fig. 1. Oil sardines being packed in baskets prior to transportation by trucks.

A close consideration of the fishery data available from areas south of Madras especially between Pondicherry and Parangipettai indicates that the occurrence of oil sardine along the coast is a regular phenomenon than incidental, although in Madras the fishery appeared for the first time in 1987. Investigations on the resource of oil sardine have been initiated on this coast only in 1987. Regular monitoring and intensive studies have to be carried out for finding out factors responsible for the emergence of oil sardine fishery along this coast.

INTRODUCTION OF 'RINGU VALA' ALONG CALICUT COAST WITH A NOTE ON ITS GENERAL IMPACT*

Introduction

Along the Calicut coast, the fishing gears in vogue like 'Mathichala vala','Ayilachala vala','Nethal vala' *etc.*, are employed to catch almost single species resources. Though there are some other gears like 'Kolli vala' (the boat-seine), the catch composition does not vary much from that of the above mentioned gears. More over, these are rarely operated in deeper waters. Hence it is interesting to note the new introduction of 'Ring-seine' net locally called 'Ringu vala' along this coast. While the industry is interested in the production and returns, the biologists are inquisitive about the influence of the fishing gear on the resources. Therefore, the authors feel it worthwhile to present a brief account of the nature of the gear along with catch composition and its general impact on the fishery along this coast.

Gear and mode of operation

'Ringu vala' (Fig. 1) is made of long wall of netting with head rope and foot rope. Each net generally has

Fig. 1. A 'Ringu vala' on the shore.

a total length of about 400 m and breadth about 70 m. This length is more when compared to the same type of net in use along the southern areas of Kerala coast. Usually the net has four types of meshes. Along the head rope and foot rope side, it has larger meshes of 4.5 and 6.5 cm respectively with a breadth of 18 cm. These are followed on either side by another piece of net of about 80 cm breadth with a mesh size of 1.8 cm. The rest of the net is of uniform mesh of either 0.7 cm or 2.5 cm. The net with 0.7 cm corresponds to the conventional 'Nethal vala' and the other to the 'Kolli vala'.

The head rope is provided with both aluminium and synthetic floats. The foot rope has lead weights at about 20 cm intervals. In addition to this, rings (Fig. 2) made of brass with about 8 cm diameter are tied to the foot rope at varying intervals. Generally 40 to 50 such rings are used in a net. This in fact earned its name 'Ringu vala'. Another rope, 'purse line' passes through these rings.

The principle employed in the operation of this net is that the fish is surrounded both vertically and horizontally. Here again the practical experience and knowledge possessed by the traditional fishermen go a long way in the successful operation of the net. As soon as the shoal is detected, one of the crew members, jumps into the water holding one end of the net. The remaining net is carried by the boat around the fish shoal and the boat comes to the initial spot. Thus the net is set around the detected shoal of fish and this is done very quickly. After setting the gear, its bottom is closed by hauling the purse-line passing through the rings. This prevents the escape of the trapped fish. Finally the net along with the catch is hauled into the canoe. A total of about 20 crew members take part in this operation. The gear is operated upto a depth of 45 m.

Craft

In the operation of the gear, a single boat is used. But here the conventional medium sized dug-out canoe of Malabar coast is replaced by the large country craft quite common along the southern parts of Kerala coast called here as 'Chundan vallam' (Fig. 3). Thus introduction of the new gear has brought another type of country craft very much new to this area. The propulsion is usually by outboard engines of 25 H.P. capacity. However, in certain cases, two outboard engines of lesser capacity are also used in a single unit. These are necessitated by the total load of the large gear, 20 crew members and bulky catch.

* Prepared by M. Sivadas and K.K. Balasubramanian, Calicut Research Centre of CMFRI, Calicut.

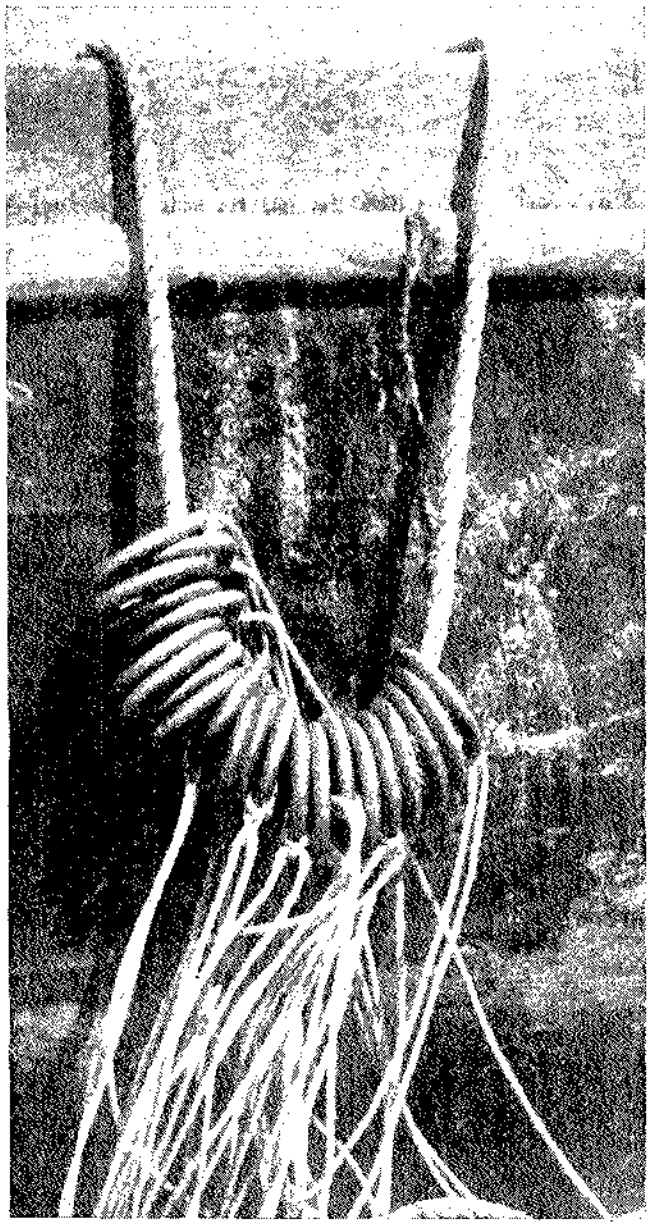


Fig. 2. The rings of 'ringu vala'.

Catch composition

The advent of this net has apparently changed the usual composition of the fish catch of this area. As the conventional gears are almost selective in fish catch the composition of the catch is predetermined. This situation may take a radical turn both quantitatively and qualitatively by the landing of the 'ringu vala'. The picture so far emerged, if indicative of what is in store, supports this. During the six week period after the introduction, large quantities of different species of fishes were landed. 3-4 tonnes of *Decapterus* sp. were landed on a day by a single unit, while 4-5 tonnes of tuna were landed on another day. Large quantities of *Thryssa* sp. and sciaenids were also landed in addition to anchovies, sardines, mackerel, cat fish, rainbow sardines and carangids. Landing of *Megalaspis cordyla* in a substantial quantity on a day was rather unusual to this area. It is also to be recorded that after many years, fishes were found drying on the shore and sciaenids, anchovies and carangids found place in them.

Fig. 3. The 'chundan vallam' from which the 'ringu vala' is operated

General remarks

Government agencies have come forward to help the ring seine fishermen for procuring the gear and the craft, and more than Rs. 1.5 lakhs have been advanced at a low interest to a single group of fishermen, who form the crew of the unit. Upto 25% subsidy is given on the advance. However, the agency, to be on the safer side, intervenes in the disposal of the catch. 45% of the total return of the day goes to the agency towards the repayment of the loan. The disposal of the catch is done through an agent recognised by both the parties at a moderate profit. The balance is shared equally by the crew members. Thus this system provides self employment for a group of fishermen and is likely to abolish the monopoly of ownership.

The gear was introduced along this coast on 28-8-1988 and already more than a dozen units are in operation. It is generally believed that the traditional fishermen are conservative by nature and are reluctant to try new methods. So when a new technique is introduced, it is likely to create resentment from atleast a section of the community. This is true for Calicut also. But for this, it looks that the gear is widely accepted by the fishermen.

Some section operate the net with the help of 4-5 conventional dug-out canoes fitted with low powered outboard engines. Here one boat is used for carrying

the net and others for the crew and catch. However, of late, 'ringu vala' owners are bit disappointed as the catches are not getting the expected return. This will be solved if the infrastructure for marketing is developed to cope up with the situation. The bulk of the fishes like tuna which are less acceptable locally, may call for diversification in marketing. This depends upon the future trend of this fisheries and its implication.

SEAWEED RESOURCES OFF TAMIL NADU COAST: KATTAPADU-TIRUCHENDUR*

Introduction

The southern coast of Tamil Nadu from Mandapam to Kanyakumari supports luxuriant growth of economically important seaweeds and the total standing crop was estimated at 22,000 tonnes (wet). All the seaweed based industries in India mostly depend on the raw material available from this area. The seaweeds exploited from this region, particularly the agarophytes *Gelidiella acerosa* and *Gracilaria edulis* are insufficient to meet the raw material requirement of the industries.

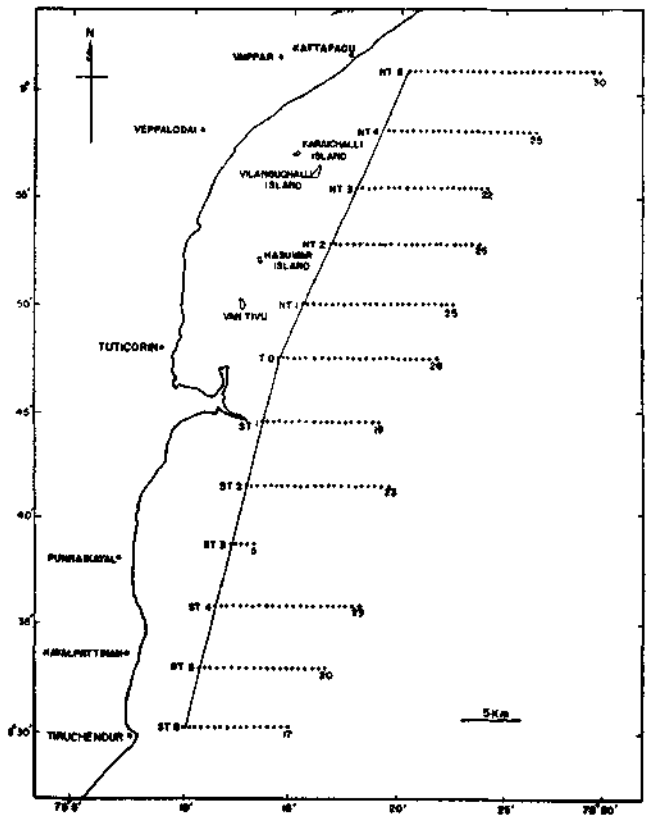


Fig. 1. Location of transects and stations surveyed. NT–Northern Transect; TO-O Transect; ST-Southern Transect.

Surveys of seaweed resources have been carried out by several workers from time to time in different regions of India to locate the seaweed growing areas and to assess the standing crop. While reviewing the seaweed resources estimates carried out from time to time by the CSMCRI, Rama Rao *(Proc. Sem. Expln. Sun, Sea & Shore, Retrospect & Prospect,* CSMCRI; 71-81, 1984) emphasizes the need for further systematic sampling surveys on the Indian coast. The total resource estimates for Gujarat, Maharashtra, Goa, Lakshadweep, Tamil Nadu, Andhra Pradesh and Orissa have been put at 77,000 tonnes (wet) and for some of the economic

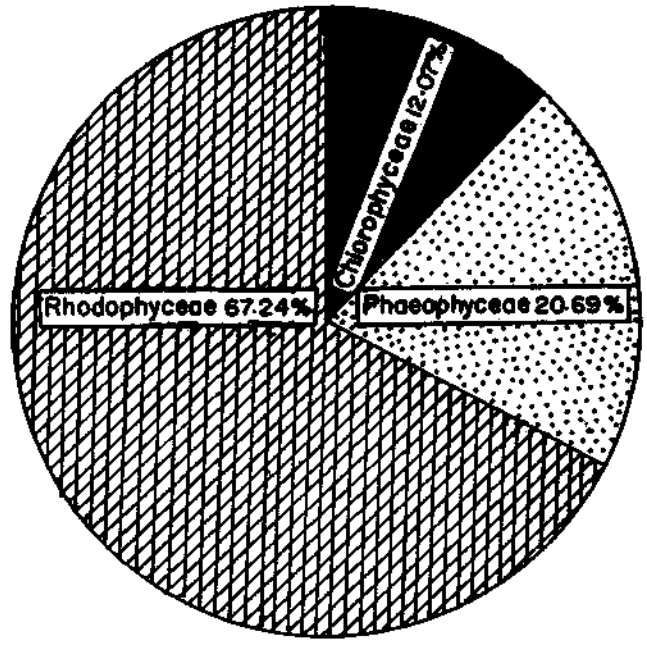


Fig. 2. Percentage composition of green, brown and red algae.

* Prepared by V.S.K. Chennubhotla, CMFRI, Cochin; N. Kaliaperumal, S. Kalimuthu, J.R. Ramalingam and S. Krishna Pillai, Regional Centre of CMFRI, Mandapam; K. Subbaramaiah, K. Rama Rao and P.V. Subba Rao, CSMCRI – Marine Algal Research Station, Mandapam.

Fig. 3. Collection of seaweed by SCUBA diving in progress.

Fig. 4. Preparing herbarium of seaweeds.

seaweeds such as *Sargassum* spp., *Turbinaria* spp., *Gelidiella acerosa*, *Gracilaria* spp. and *Hypnea* spp. are 31,200, 700, 1,000, 3,000 and 16,000 tonnes respectively. All these surveys have been restricted to nearshore areas of the coast (4m depth). Only very few attempts were made on the qualitative survey of seaweeds occurring beyond this depth range. In order to locate and assess the standing crop of seaweeds from these depths (5.5–17 m) in Gulf of Mannar region, Central Marine Fisheries Research Institute and Central Salt & Marine Chemicals Research Institute have jointly undertaken the survey of seaweed resources from Kilakkarai to Kanyakumari. The results obtained on the survey conducted from Kattapadu to Tiruchendur during December, 1986 to March, 1987 are presented here.

Among the 260 stations sampled covering in all 12 transects, only 50 stations had vegetation. The seaweeds were generally found growing on the rocky/coral

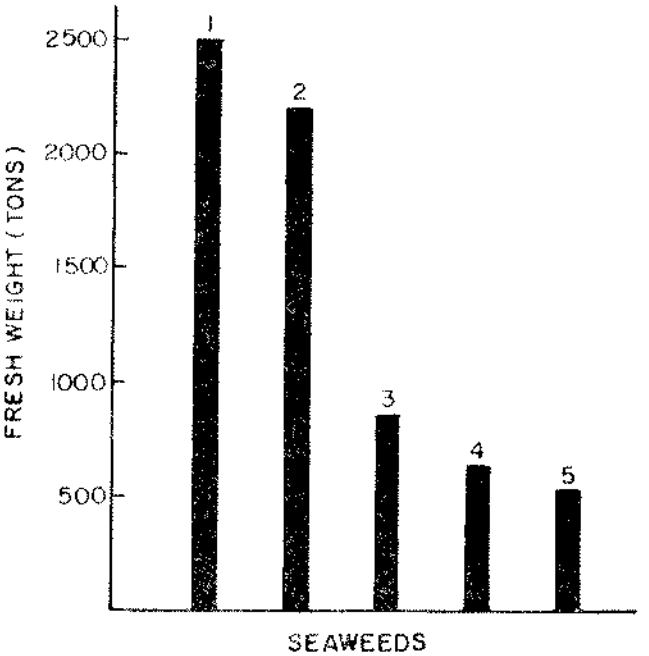


Fig. 5. Standing crop of some commercially important seaweeds in order of their abundance. 1. *Hypnea valentiae*; 2. *Solieria robusta*; 3. *Dictyota bartayresiana*; 4. *Sargassum tenerrimum*; 5. *Dictyota maxima*.

substratum. The total area surveyed was 650 sq. km. However, only 125 sq. km supported vegetation whose biomass was 9,100.5 tonnes (wet). In the sampling stations, the biomass of seaweeds varied from a minimum of 5 g/m^2 to a maximum of 785 g/m^2. A total of 34 genera and 58 species of algae were recorded from all the 12 transects of which 5 genera and 7 species belonged to Chlorophyta, 5 genera and 12 species to Phaeophyta and 24 genera and 39 species to Rhodophyta. The percentage composition of green, brown and red algae is given in Fig. 2. Out of 58 species recorded, 32 species were found in estimable quantities (> 5 g/m^2). The seaweeds with biomass above 500 tonnes (wet) were *Sargassum tenerrimum*, *Dictyota bartayresiana*, *D.maxima* *Solieria robusta* and *Hypnea valentiae*. Totally 3 species of seagrasses *Cymodocea serrulata*, *Halophila ovalis* and *H. ovata* were recorded at the depths ranging from 7 to 16 m. The present survey reveals that species of *Sargassum* and *Hypnea* that occur in large quantities near Tuticorin and Tiruchendur respectively can be exploited for manufacture of phycocolloids.

ON AN UNUSUALLY LARGE SEA COW *DUGONG DUGON* LANDED AT MANDAPAM, GULF OF MANNAR*

An unusually large sized male sea cow *Dugong dugon* measuring 310 cm in total length captured from the Gulf of Mannar using dynamite sticks is reported. This is the first record of a dugong exceeding 300 cm in total length from the Gulf of Mannar. Stomach contents, heart, liver and copulatory organ of the dugong were examined.

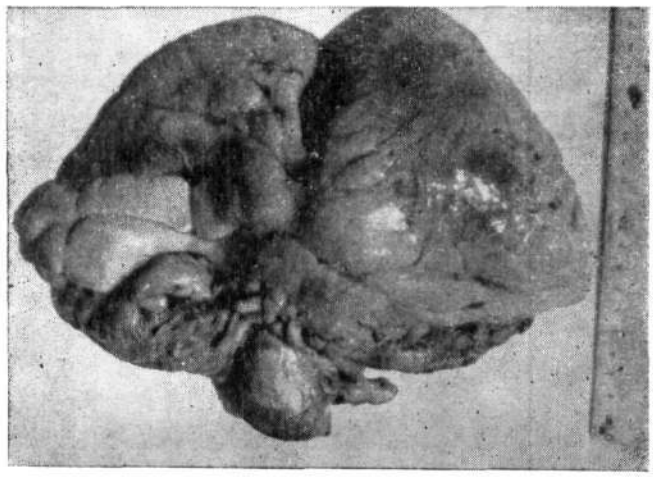


Fig. 1. Heart of the dugong. Note the dorso - laterally flattened shape and the prominent inter-ventricular cleft.

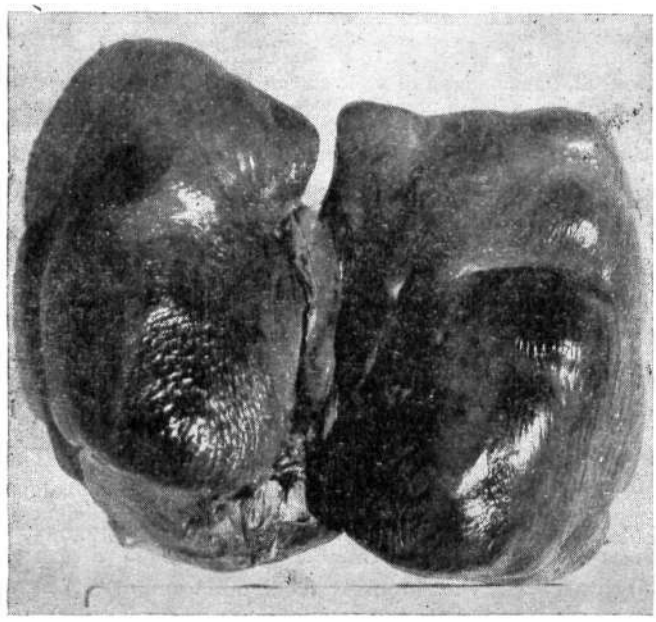


Fig. 2. The liver – a dorsal view.

The sea cow *Dugong dugon* popularly known as 'Avolia' and 'Kadal panni' (Sea pig) in Tamil and 'Babloo' in Saurashtra and Kutch is a herbivorous mammal that occurs in coastal waters where sea grasses are abundant offering food and shelter. In India, the dugong occurs commonly in the Gulf of Mannar and the Palk Bay and in very stray numbers in the Gulf of Kutch. It is also reported from the Malabar coast and the Andamans.

On 16th December, 1986 around 1630 hrs a dugong was reported killed by Sri Lankan refugees using dynamite sticks in the inshore waters of Gulf of Mannar (depth 2 m; distance from shore 100 m) very close to the Regional Centre of CMFRI., Mandapam. Eye witnesses reported that a pair of adult dugongs were sighted several times close to the shore between 1530 and 1630 hrs on that day. On further enquiry it was learnt that dynamite sticks were hurled into the sea by some youngmen when the pair surfaced for breathing. As a result, one of the dugongs was killed and the other was presumed to have escaped.

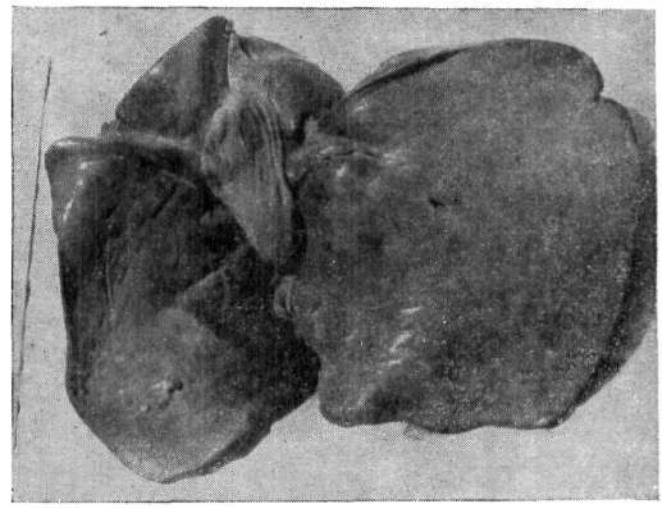


Fig. 3. The liver – a ventral view.

Its weight was estimated to be about 400 kg. According to Harrison and King *(Marine Mammals, 2nd Ed., Hutchinson, London* 192 *PP*, 1980*)* the dugong seldom attains a length over 240 cm. However, Mani *(J. Bombay Nat. Hist. Soc.,* **57**: 216-217, 1960) reported a dugong measuring 406 cm in total length and 1,016 kg in total body weight. But Silas *(J. Bombay Nat. Hist. Soc.,* **58**: 263-266, 1961) considered it to be highly improbable.

* Prepared by S. Krishna Pillai, J.D. Ambrose and M. Sivadas, Regional Centre of CMFRI, Mandapam.

Table 1. *Morphometric measurements (in cm) of the male dugong captured from the Gulf of Mannar*

Length from:		
Snout to the deepest point of fluke notch (Total length)	:	310.0
Snout to anus	:	270.0
Snout to origin of genital organ	:	160.0
Distance between origin of genital organ and anus	:	52.0
Snout to origin of flipper	:	60.0
Distance between:		
Flippers	:	59.0
Eyes	:	58.0
Snout and eye	:	58.0
Snout and nostril	:	18.0
Length of flipper	:	54.0
Girth at neck region (at origin of flippers)	:	180.0
Girth at genital orifice	:	200.0
Girth at anus	:	135.0

Table 2. *Dimensions of the heart of the dugong (in cm)*

Length of the heart (base to apex)	:	14.1
Breadth of the heart (at its widest point)	:	23.1
Breadth of the right chamber (at its widest point)	:	13.4
Breadth of the left chamber (at its widest point)	:	9.7
Length of the right chamber	:	14.1
Length of the left chamber	:	12.1
Distance from base of heart to origin of inter-ventricular cleft	:	6.4

In consideration of these facts, the data on size (total length) of the present specimen indicates that this is the largest dugong so far recorded from the Indian waters. The various morphometric measurements of the dugong are presented in Table 1.

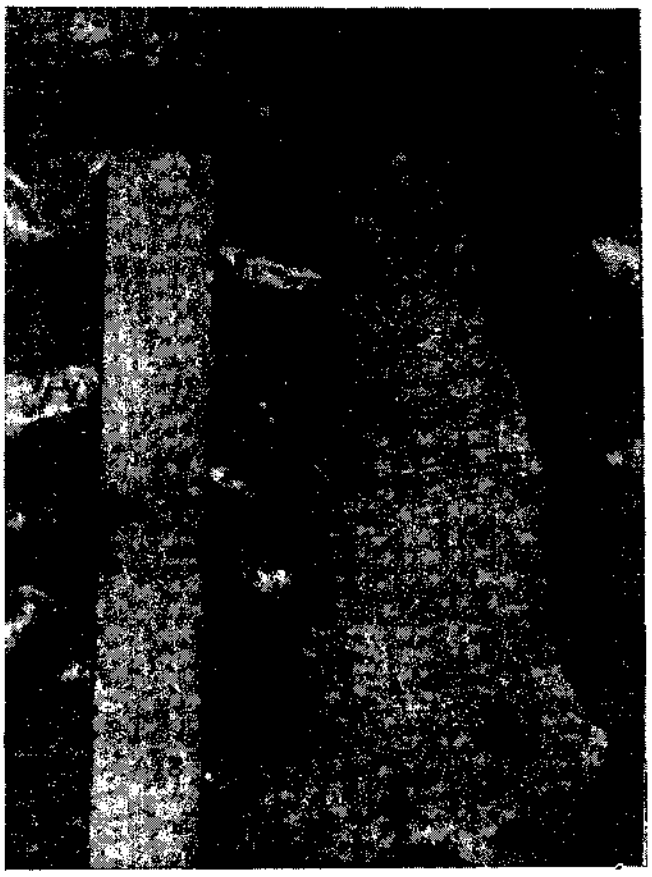


Fig. 4. The male copulatory organ.

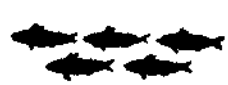
Stomach contents: Partially masticated as well as whole blades of sea grass belonging to the genus *Cymodocea* were recovered from the oesophagus and the buccal cavity indicating beyond doubt that the animal was hit while grazing. The stomach was full and sea grass constituted the major component of its contents.

UNUSUAL LANDINGS OF GOAT FISHES BY TRAWL NETS AT VISAKHAPATNAM*

It was observed that during April–May, '88, unusually heavy quantities of goat fishes were landed by private trawlers off Visakhapatnam operated at a depth of 25–35 metres. The total catches of goat fishes are 130.8, 232.3 and 178.2 t in April, May and June respectively. Among the goat fishes *Upeneus vittatus, U. sulphureus* and *U. molluscccuns* are the species which 25% and 5% respectively. In April and May heavy landings of *Upeneus* spp. are reported with C.P.H. values 7.6 and 14.17 kg/hr respectively.

U. vittatus ranged in size from 82 to 111 mm in total length. The average size is 105 mm and the weight is 12 gm. The fishes were immature and stomachs were found to be empty or filled with remnants of crustaceans.

*Reported by T. Appa Rao, K. Narayana Rao and M. Chandrasekhar, Visakhapatnam Research Centre of CMFRI, Visakhapatnam.



UNUSUAL LANDINGS OF YOUNG OIL SARDINE OFF MADRAS COAST*

The occurrence of young oil sardines *Sardinella longiceps* noticed in good quantities from 10–24 November, 1988 in indigenous boat seine (*Thuri valai*) catches is reported here. The catches were obtained in the very early hours of the day at 3 to 5 metres depth just about a kilometre away from the landing centre at Kasimedu. It is not uncommon to find young oil sardine along the west coast of India from July to October. The present observation is the first on record showing that young oil sardine occurs in fairly good quantities during November along the Madras coast. The details of the catch recorded during the period of landings are given below:

Date	No. of units operated	Estimated catch (kg)	CPUE (kg)
10–11–'88	12	3,000	250
17–11–'88	15	3,000	200
18–11–'88	10	2,100	210
21–11–'88	5	500	100
24–11–'88	5	200	40

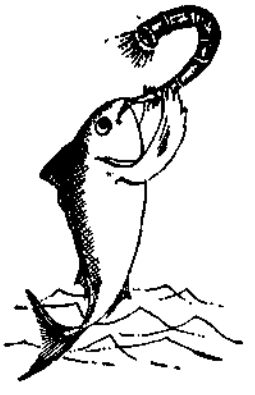
On the first day of observation about 250 kg of young oil sardine was recorded per net and the catch declined to about 40 kg per net on the last day of landing. Young oil sardine were sold at Re. 1 per kg in the market, whereas large quantities of young ones were dried on the beach.

The predominant size group of young oil sardine landed was 60 - 64 mm in length and the minimum and maximum sizes noticed among this group were 40 and 107 mm respectively.

Investigations carried out on the maturity condition of oil sardine along Madras coast in recent years showed that mature and ripe fish were encountered from May to August. It could be seen that both on west and east coasts of India the spawning season is prolonged extending from May - June to September - October. Incidently it may be mentioned here that Gnanamuttu reported the occurrence of mature oil sardine along Madras coast earlier during January - March period (*Indian J. Fish.*, **31** (3) 1984).

It is of interest to note that a small sample of adult oil sardine obtained during the period of occurrence of young ones were all in spent recovering stage II and this stage was noticed in October also. Hence it is considered that the young stages obtained in November off Madras coast were probably the result of spawning a few months earlier along the coast.

*Prepared by J.C. Gnanamuttu, Bastian Fernando and S. Chadrasekhar, Research Centre of CMFRI, Madras.



मद्रास तट के आसपास रहनेवाले समुद्री धीवरों की आर्थिक-सामाजिक स्थिति*

मात्स्यिकी के विकासात्मक कार्यक्रम के सूत्रण का लक्ष्य उत्पादन बढाना और इसमें मग्न लोगों की आर्थिक स्थिति उन्नत करना है। इस तरह के कार्यक्रमों का सफल कार्यान्वियन लक्षित वर्गों के समाज आर्थिक स्थिति पर आश्रित है। मात्स्यिकी के आयोजन एवं प्रबंधन केलिए सामाजिक और आर्थिक पहलुओं पर अत्यधिक ध्यान देना आवश्यक है। इस तरह की सूचनाओं का अभाव प्रभावी नीति निर्माण और आयोजन के मार्ग में खडे गंभीर बाधाओं में एक है। इसका असर मुख्यतः लघु मत्स्य उद्योग में पडता है। इस अवस्था में केन्द्रीय समुद्री मात्स्यिकी अनुसंधान संस्थान ने चुने हुए क्षेत्रों में समाज-आर्थिक सर्वेक्षण चलाने केलिए एक परियोजना प्रारंभ की है। इसकेलिए तिरुवट्टियूरकुप्पम और पुतुमनैकुप्पम नाम के दो गाँवों में सर्वेक्षण चलाया गया।

तिरुवट्टियूरकुप्पम के पट्टिनावेरकुप्पम सेगमेन्ट में 137 घरों और पुतुमनैकुप्पम के 601 घरों के सामाजिक आर्थिक स्थिति के बारे में अध्ययन किया। अध्ययनों के अनुसार इसमें लगभग 95% लोग पट्टिनावेर जाति के है। बाकी हरिजन तेलुगुनायिडु और ईसाई मीनवा जाति के हैं। दोनों गाँवों के 90 % और 66% लोग छोटी झोंपडी में रहते है और अच्छा प्रतिशत अनपढ है। दोनों गाँवों के कमाऊ लोगों और उनपर आश्रित लोगों का अनुपात 1:3 (पुतुमनैकुप्पम) और 1:2 (तिरुवट्टियूरकुप्पम) है। आधे प्रतिशत से अधिक लोगों का मुख्य पेशा मत्स्यन है।

तिरुवट्टियूरकुप्पम के लोग मत्स्यन केलिए अयंत्रीकृत तरीके का इस्तेमाल करते है। लेकिन पुतुमनैकुप्पम में परंपरागत और यंत्रीकृत दोनों रीतियों को अपनाये हैं। तिरुवट्टियूरकुप्पम में 55% घरों को और पुतुमनैकुप्पम में 16% घरों को अपना, काम्रट और संभार है। दोनो गाँवों के अधिकांश परिवारों की प्रतिवर्ष आय 2,000 - 4,000 रु. के बीच है। इनमें अधिकांश मज़दूर है। पुतुमनैकुप्पम और तिरुवट्टियूर-कुप्पम के धीवर परिवारों की औसत आय यथाक्रम 7,600 और 4,500 रु. है। जिन परिवारों में कम से कम सदस्य मत्स्यन को छोडकर अन्य काम करता है एसे घरों की औसत आय 9,500 और 7,000 रु. के बीच दीख पडी। घरेलू खर्च में अच्छा हिस्सा खाद्य वस्तुओं केलिए और यात्रा केलिए खर्च किया जाता है। शिक्षा और चिकित्सा केलिए बहुत कम खर्च करता है। यहाँ परंपरागत मत्स्यन करने वाले परिवारों को उधार मिलना काफी कठिनाई की बात है। दोनों गाँवों में मत्स्यन करने वाले लगभग 40% लोग ऋणी है।

तिरुवट्टियूर और पुतुमनैकुप्पम इन दोनों गाँवों में स्थलन केन्द्रों और प्राथमिक बाज़ारों होते हैं। तिरुवट्टियूरकुप्पम में मत्स्यन व्यापारियों की संख्या कम है और साधारणतया धीवरों को कम दाम मिलता है। मद्रास क्षेत्र में समुद्री मात्स्यिकी के विपणन कार्यकलापों में स्त्रियां ही आगे है। स्थलन केन्द्रों में निपटान की तरीका नीलाम है।

अध्ययन के आधार पर यहाँ के मछुओं के सर्वतोमुखी विकास केलिये रखे गये सुझावे इस प्रकार है। कट्टामरन का दाम बढ जाने के कारण मछुए उन्हें बदलने में असमर्थ हो जाते हैं। इसलिए राज्य के वन विभाग सबसिडैसड रूप से कट्टमरन की सप्लाई करनी चाहिये। मत्स्यन उपस्करण और विपणन केलिये आवश्यक वित्त न्यायोचित कर दर में प्राप्त करने को ग्रामीण तल पर सहकारी संघों की स्थापना करनी चाहिये। पुतुमनैकुप्पम जो मद्रास के सब से बडा स्थलन केन्द्र है वहाँ का पत्तन मछुओं के उपयोग केलिये सज्ज करना चाहिये और पकडी गयी मछली के परिरक्षण केलिये आवश्यक प्राथमिक सुविधाओं का निर्माण करना चाहिये। यंत्रीकृत और अयंत्रीकृत सेक्टरों के बीच का संघर्ष दूर करने को यंत्रीकृत मत्स्यन पर नियंत्रण लाना चाहिये।

* सी. एम. एफ. आर. आइ. कोचिन के आर. सत्यदास और के. के. वी. पनिक्कर द्वारा तैयारित।

मद्रास तट पर तारली मात्स्यिकी का निर्गम*

मद्रास तट पर 1987 वर्ष में मई से सितंबर के दौरान तारली या नल्लामत्ती का अभूतपूर्व निर्गम दिखायी पडी। एक परंपरागत संभार जिसका स्थानीय नाम है "इडवलै" से तारली मात्स्यिकी पकडी गयी। तिरुवाणियूर से दूर 6 से 10 मी. गहराई में और मद्रास के काशिमेड से 15 कि. मी. दक्षिण से पकड मिली। पकडी गयी तारलियों में 90% 120-145 मि. मी. लंबाई की थी। मई-सितंबर की अवधि में प्राप्त मछलीयाँ अप्रौढ थी। जनवरी-मार्च में पकडी गयी प्रौढ मछलियों में पुरुष जाति अधिक थे।

मद्रास के दक्षिण क्षेत्र से प्राप्त डाटा के अनुसार मद्रास में विशेषतः पोण्डिचेरी और परन्गीपट्टै के बीच तारली की उपस्थिती एक नियमित परिघटना है। वर्ष 1987 से तारली संपदा पर एक जाँच शुरू की है। इस तट पर तारली के अति निर्गम के कारण जानने केलिए नियमित मानिटरिंग और अध्ययन बहुत आवश्यक है।

* सी. एम. एफ. आर. आइ. के मद्रास केंद्र के जे. सी. ज्ञानमुत्तु और वी. तंकराज सुब्रह्मण्यन द्वारा तैयारित।

कालिकट तट पर "रिंगुवला" की प्रस्तुति और इसका प्रभाव*

कालिकट तट पर साधारणतया नियोजित संभार है "मत्तिच्चालावला", "अयिलच्चालावला", "नेतालवला" आदि। इसके अलावा "कोल्लिवला" (कोप संपाश) भी प्रयोग में है। इन सबों की पकड संघटन में अधिक फरक भी नहीं दिखायी पडती है और गंभीर जलों में इसका प्रयोग भी नहीं किया जाता है। इसलिए इस तट पर वलय संपाश जिसे "रिंगुवला" नाम से पुकारा जाता है, की प्रस्तुति ध्यान देने योग्य बात है।

"रिंगुवला" का निर्माण लंबी दीवारवाले जालों में शिरोरस्सी और पगरस्सी बाँधकर किया जाता है। हर एक जाल लगभग 400 मी. लंबाई और 70 मी. चौडाई की होती है। शिरोरस्सी में ऐलुमिनियम और संश्लिष्ट प्लवें होंगे। पगरस्सी के 20 से. मी. के अंतर में लेड से निर्मित भार लटकाता है। इसके अतिरिक्त पीतल से निर्मित 8 से. मी. व्यास के वलय पगरस्सी पर विविध अंतर में बांध देते हैं। लगभग 40 से 50 वलयों का उपयोग प्रस्तुत जाल में किया जाता है।

मत्स्यों को ऊर्ध्वधर और क्षैतिज रूप से घेरकर पकडना इस जाल का निर्माण तत्व है। इसका प्रचालन 45 मी. की. गहराई तक होता है।

कालिकट के तटों में रिंगुवला की प्रस्तुति से पकड संघटन में बडा अन्तर आया है। इसके प्रचालन से विविध जाति की मछली भारी मात्रा में पकडी गयी। यहाँ से साधारणतय न मिलनेवाली मछली जैसे मेगालासपिस कोर्डिला का स्थलन इस जाल की प्रस्तुति की विशेषता है।

* सी. एम. एफ. आर. आइ. कालिकट अनुसंधान केन्द्र के के. के. बालसुब्रह्मण्यम द्वारा तैयारित।

तमिलनाडु के अपतट कट्टप्पाडु - तिरुचेन्दूर में समुद्री शैवाल संपदायें*

तमिलनाडु में मण्डपम से लेकर कन्याकुमारी तक के दक्षिण तट पर आर्थिक दृष्टि से महत्वपूर्ण समुद्री शैवाल का पिपुल संपदा है और यहाँ के खडी फसल 22,000 मी. टन (गीला) प्राक्कलित किया गया है। भारत के समुद्री शैवाल पर आधारित अधिकांश उद्योग यहाँ से प्राप्त असंस्कृत पदार्थ पर आश्रित है। इस क्षेत्र से समुपयोजित समुद्री शैवाल असंस्कृत पदार्थों की आवश्यकता निभाने में अपर्याप्त है।

भारत में समुद्री शैवाल बढने वाले क्षेत्रों एवं खडी फसल के निर्धारण के बारे में कई सर्वेक्षण चलाया गया। गुजरात, महाराष्ट्र, गोआ, लक्षद्वीप, तमिलनाडु, आन्ध्रप्रदेश और उडीसा में प्राक्कलित कुल संपदा 77,000 मी. टन (गीला) है। सरगासम एस. पी. पी. टरबिनोरिया एस. पी. पी., जेलीडियेल्ला ऐकरोसा, ग्रासिलेरिया एस. पी. पी. और हैपनिआ एस. पी. पी. यथाक्रम 31,200, 700, 1,000, 3,000 और 16,000 मी. टन है। गंभीर जलों में समुद्रीशैवाल खडी फसल निर्धारण करने केलिए सी. एम. एफ. आर. आई. और केन्द्रीय नमक और समुद्री रसायनिक अनुसंधान संस्थान ने किलाक्करै से कन्याकुमारी तक के मान्नार-खाडी क्षेत्र के समुद्री शैवाल तल का संयुक्त सर्वेक्षण किया। सर्वेक्षण किये गये कुल 650 वर्ग कि. मी. में 125 वर्ग कि. मी. में वनस्पति दिखाई पडी। इसकी जीवमात्रा 9,100.5 मी. टन थी।

* सी. एम. एफ. आर. आइ. कोचिन के वी. एस. के. चेन्तुबोतला, मण्डपम क्षेत्र केंद्र के एन. कालियापेरुमाल, एस. कालिमुत्तु, जे. आर. रामलिंगम और सी. एस. एम.सी. आर. आइ. मण्डपम के के. सुब्बराम, के राम राऊ और पी. वी. सुब्बराऊ द्वारा तैयारित।

मण्डपम कैम्प के मान्नार खाडी में एक असामान्य आकार की समुद्री गाय डयूगोंग डयूगोन का स्थलन*

मान्नार खाडी से 310 से. मी. लंबाई की असामान्य आकार के एक डयूगोंग डयूगोन डाइनामयिट स्टिकों के ज़रिए पकडी गयी। अभी तक पकडी गयी समुद्री गायों की लंबाई 300 से. मी. से अधिक नहीं आयी है। इसलिये लंबाई की दृष्टि से यह एक प्रथम रेकोर्ड है।

समुद्री गाय डयूगोंग डयूगोन जो तमिल में "अवोलिया" व "कडलपन्नी" और सौराष्ट्र और कच्च में "बाबलू" नाम से पुकारा जाता है, शाकाहारी है। भारत में यह साधारणतया मान्नार खाडी में दिखायी पडती है।

* एस. कृष्णपिल्लै, जे. डी. अंब्रोस और एम. शिवदास द्वारा सी. एम. एफ. आर. आइ. मण्डपम केंद्र से रिपोर्ट की गयी ब्यौरा।

विशाखपट्टनम में ट्राल जालों के ज़रिए लाल मुल्लेट मछलियों का असामान्य स्थलन*

विशाखपट्टनम में 1988 अप्रैल-मई के दौरान लाल मुल्लेट मछलियों का भारी स्थलन हुआ। अप्रिल, मई और जून में यथाक्रम 130.8, 232.3 और 178.2 मेट्रिक टन पकड प्राप्त हुई। लाल मुल्लेट मछलियों में युपेन्यूस विट्टाट्स, यु. सलफयूरियस और यु. मलस्कनस आदि का देन यथाक्रम 70%, 25% और 5% है। अप्रिल और मई में यूपेन्यूस एस. पी. पी. का भारी स्थलन की रिपोर्ट मिली। इसका सी. पी. एच. वाल्यू यथाक्रम 7.6 और 14.17 कि. ग्रा./हेक्टर है। यू. विट्टाट्स की लंबाई 82 से 111 मि. मी. है। औसत आकार 105 मि. मी. और भार 12 ग्राम है।

* विशाखपट्टनम अनुसंधान केन्द्र के टी. अप्पाराऊ, नारायण राऊ और चन्द्रशेखरन द्वारा तैयारित रिपोर्ट।

मद्रास के अपतटों में तरुण तारलियों का असामान्य स्थलन*

मद्रास के अपतटों में नवंबर, 1988 के दौरान तरुण तारली सारडिनेला लोंगिसेपस का असामान्य स्थलन हुआ। भारत के पश्चिमी तटों में जुलाई-अक्तूबर के दौरान तारली को देखना असाधारण नहीं है। लेकिन नवंबर के दौरान मद्रास के तटों में अच्छी मात्रा में तरुण तारलियों की उपस्थिति यह पहली बार रिपोर्ट की गयी है। पाई गयी तरुण तारली 40 मि. मी. और 107 मि. मी. के बीच के आकार की थी।

* मद्रास अनुसंधान केन्द्र के जे. सी. ज्ञानभुत्तु, बास्टिन, फेरनान्डो और एस. चन्द्रशेखर द्वारा तैयारित ब्यौरा।

GUIDE TO CONTRIBUTORS

The articles intended for publication in the MFIS should be based on actual research findings on long-term or short-term projects of the CMFRI and should be in a language comprehensible to the layman. Elaborate perspectives, material and methods, taxonomy, keys to species and genera, statistical methods and models, elaborate tables, references and such, being only useful to specialists, are to be avoided. Field keys that may be of help to fishermen or industry are acceptable. Self-speaking photographs may be profusely included, but histograms should be carefully selected for easy understanding to the non-technical eye. The write-up should not be in the format of a scientific paper. Unlike in journals, suggestions and advices based on tested research results intended for fishing industry, fishery managers and planners can be given in definitive terms. Whereas only cost benefit ratios and indices worked out based on observed costs and values are acceptable in a journal, the observed costs and values, inspite of their transitionality, are more appropriate for MFIS. Any article intended for MFIS should not exceed 15 pages typed in double space on foolscap paper.

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